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PATENT  
Attorney Docket No.: 2307Z-085830US  
Client Reference No.: 98-207-4

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

jc889 U.S. PRO  
05/898132  
07/03/01

In re application of:

NICHOLAS L. ABBOTT et al.

Continuation of Application  
No. 09/127,382

Filed: July 31, 1998

For: OPTICAL AMPLIFICATION OF  
MOLECULAR INTERACTIONS USING  
LIQUID CRYSTALS

Examiner: Celsa, B.

Art Unit: 1627

INFORMATION DISCLOSURE  
STATEMENT UNDER 37 CFR §1.97 and  
§1.98

Assistant Commissioner for Patents  
Washington, D.C. 20231


Sir:

The references cited on attached form PTO-1449 are being called to the attention of the Examiner. In accordance with 37 CFR §1.98(d), copies of the references can be found in Application No. 09/127,382, filed July 31, 1998 (Attorney Docket No. 2307Z-085810US). Also enclosed is a copy of the Search/Examination report corresponding to the PCT application. It is respectfully requested that the cited references be expressly considered during the prosecution of this application, and the references be made of record therein and appear among the "references cited" on any patent to issue therefrom.

As provided for by 37 CFR 1.97(g) and (h), no inference should be made that the information and references cited are prior art merely because they are in this statement and no representation is being made that a search has been conducted or that this statement encompasses all the possible relevant information.

Applicant believes that no fee is required for submission of this statement, since it is being submitted prior to the first Office Action. However, if a fee is required, the Commissioner is authorized to deduct such fee from the undersigned's Deposit Account No. 20-1430. Please deduct any additional fees from, or credit any overpayment to, the above-noted Deposit Account.

Respectfully submitted,



Jeffrey S. Mann  
Reg. No. 42,837

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Substitute for form 1449A/PTO

Complete if Known

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 4

Application Number	Continuation of Application No. 09/127,382
Filing Date*	July 31, 1998
First Named Inventor	Abbott, Nicholas
Group Art Unit	1627
Examiner Name	Celsa, B.
Attorney Docket Number	2307Z-085830US

### U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			
	AA	4,513,034A		Sparer	04/23/85	
	AB	4,597,942		Meathrel, W. G.	07/01/86	
	AC	4,902,106A		Dijon	02/20/90	
	AD	5,071,526		Pletcher <i>et al.</i>	12/10/91	
	AE	5,130,828		Ferguson, J.L.	07/14/92	
	AF	5,618,493		Goldstein <i>et al.</i>	04/08/97	
	AG	5,658,491A		Kistner	08/19/97	
	AH	5,677,195A		Winkler <i>et al.</i>	10/14/97	

### FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				
	AI	PCT	WO 94/03496 A		Csiro	02/17/94		<input type="checkbox"/>
	AJ	PCT	WO 97/32202 A		University of Leeds	09/04/97		<input type="checkbox"/>
	AK	PCT	WO 97/33737 A		Harvard College	09/18/97		<input type="checkbox"/>
	AL	PCT	WO 97/35198 A		Ontogen	09/25/97		<input type="checkbox"/>
	AM	PCT	WO 98/04652 A		US Naval Research	02/05/98		<input type="checkbox"/>

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<sup>1</sup> Unique citation designation number. <sup>2</sup> See attached Kinds of U.S. Patent Documents. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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		Filing Date	July 31, 1998
		First Named Inventor	Abbott, Nicholas
		Group Art Unit	1627
		Examiner Name	Celsa, B.
Sheet 2 of 4	Attorney Docket Number		02307Z-085830US

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	AN	Bain, C.D., <i>et al.</i> , "Formation of Monolayers by the Coadsorption of Thiols on Gold: Variation in the Length of the Alkyl Chain," <i>J. Am. Chem. Soc.</i> , 111:7164-7175 (1989)	<input type="checkbox"/>
	AO	Charych, D., <i>et al.</i> , "A 'litmus test' for molecular recognition using artificial membranes," <i>Chemistry &amp; Biology</i> 3(2):113-120 (1996)	<input type="checkbox"/>
	AP	Charych, D.H., <i>et al.</i> , "Direct Colorimetric Detection of a Receptor-Ligand Interaction by a Polymerized Bilayer Assembly," <i>Science</i> 261:585-588 (1993)	<input type="checkbox"/>
	AQ	Cognard, J., "Alignment of Nematic Liquid Crystals and Their Mixtures," <i>Mol. Cryst. Liq. Cryst.</i> , 1:1-74 (1982)	<input type="checkbox"/>
	AR	Drawhorn, R.A., <i>et al.</i> , "Anchoring of Nematic Liquid Crystals on Self-Assembled Monolayers Formed from Alkanethiols on Semitransparent Films of Gold," <i>J. Phys. Chem.</i> , 99(45):11-16515 (1995)	<input type="checkbox"/>
	AS	Frey, B.L., <i>et al.</i> , "Covalent Attachment and Derivatization of Poly(L-lysine) Monolayers on Gold Surfaces As Characterized by Polarization-Modulation FT-IR Spectroscopy," <i>Analytical Chemistry</i> 68(18):3187-3193 (1996)	<input type="checkbox"/>
	AT	Gupta, V.K., <i>et al.</i> , "Design of Surfaces for Patterned Alignment of Liquid Crystals on Planar and Curved Substrates," <i>Science</i> 276:1533-1536 (1997)	<input type="checkbox"/>
	AU	Gupta, V.K., <i>et al.</i> , "Optical Amplification of Ligand-Receptor Binding Using Liquid Crystals," <i>Science</i> 279(5359):2077-2080 (3/27/98)	
	AV	Gupta, V.K., <i>et al.</i> , "Uniform Anchoring of Nematic Liquid Crystals on Self-Assembled Monolayers Formed from Alkanethiols on Obliquely Deposited Films of Gold," <i>Langmuir</i> 12:2587-2593 (1996)	<input type="checkbox"/>
	AW	Hickman, J.J., <i>et al.</i> , "Rational pattern design for in vitro cellular networks using surface photochemistry," <i>J. Vac. Sci. Technol.</i> , 12(3):607-16 (1994)	<input type="checkbox"/>
	AX	Hiltrop, J.K., <i>et al.</i> , "On the Alignment of Thermotropic Nematic and Smectic Liquid Crystals on Lecithin Coated Surfaces," <i>Ber. Bunsenges. Phys. Chem.</i> , 98(2):209-213 (1994)	<input type="checkbox"/>
	AY	Jackman, R.J., <i>et al.</i> , "Fabrication of Submicrometer Features on Curved Substrates by Microcontact Printing," <i>Science</i> , 269:664-665 (1995)	<input type="checkbox"/>
	AZ	Jerome, B., "Surface effects and anchoring in liquid crystals," <i>Rep. Prog. Phys.</i> 54:391-451 (1991)	<input type="checkbox"/>

Examiner Signature	Date Considered
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Substitute for form 1449B/PTO  <h2 style="text-align: center; margin: 10px 0;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</h2> <p style="text-align: center; margin-top: 20px;">(use as many sheets as necessary)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center; padding: 2px;">Complete if Known</th> </tr> <tr> <td style="width: 50%; padding: 2px;">Applicant Number</td> <td style="padding: 2px;">Continuation of Application No. 09/127,382</td> </tr> <tr> <td style="padding: 2px;">Filing Date</td> <td style="padding: 2px;">July 31, 1998</td> </tr> <tr> <td style="padding: 2px;">First Named Inventor</td> <td style="padding: 2px;">Abbott, Nicholas</td> </tr> <tr> <td style="padding: 2px;">Group Art Unit</td> <td style="padding: 2px;">1627</td> </tr> <tr> <td style="padding: 2px;">Examiner Name</td> <td style="padding: 2px;">Celsa, B.</td> </tr> <tr> <td style="padding: 2px;">Attorney Docket Number</td> <td style="padding: 2px;">02307Z-085830US</td> </tr> </table>	Complete if Known		Applicant Number	Continuation of Application No. 09/127,382	Filing Date	July 31, 1998	First Named Inventor	Abbott, Nicholas	Group Art Unit	1627	Examiner Name	Celsa, B.	Attorney Docket Number	02307Z-085830US
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Sheet 3 of 4

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	AAA	Kim, T., "Polymeric Self-Assembled Monolayers. 5. Synthesis and Characterization of $\omega$ -Functionalized, Self-Assembled Diacetylenic and Polydiacetylenic Monolayers," <i>Langmuir</i> 12:6065-6073 (1996)	<input type="checkbox"/>
	ABB	Kumar, A., et al., "Patterned Self-Assembled Monolayers and Meso-Scale Phenomena," <i>Acc. Chem. Res.</i> , 28:219-226 (1995)	<input type="checkbox"/>
	ACC	Lenk, T.J., et al., "Structural Investigation of Molecular Organization in Self-Assembled Monolayers of a Semifluorinated Amidethiol," <i>Langmuir</i> 10(12):4610-4617 (12/94)	
	ADD	Miller, W.J., et al., "Planar Anchoring of Nematic 5CB on Self-Assembled Monolayers Formed From Alkanethiols on Gold," <i>Applied Physics Letters</i> 69(13):1852-1854 (09/23/96)	
	AEE	Mrksich, M, et al., "Using Self-Assembled Monolayers to Understand the Interactions of Man-Made Surfaces with Proteins and Cells," <i>Annu. Rev. Biophys. Biomol. Struct.</i> , 25:55-78 (1996)	<input type="checkbox"/>
	AFF	Pan, J.J., et al., "Molecular Recognition and Colorimetric Detection of Cholera Toxin by Poly(diacetylene) Liposomes Incorporating G <sub>m1</sub> Ganglioside," <i>Langmuir</i> 13:1365-1367 (1997)	<input type="checkbox"/>
	AGG	Pozziomek, E.J., et al., "Use of Liquid Crystals as Vapor Detectors," <i>Mol. Cryst. Liq. Cryst.</i> , 27(1-2):175-185 (5/1973)	<input type="checkbox"/>
	AHH	Proust, J.E., et al., "Orientation of a Nematic Liquid Crystal by Suitable Boundary Surfaces," <i>Solid State Commun.</i> 11:1227-1230 (1972)	<input type="checkbox"/>
	AII	Spinke, J., et al. "Molecular recognition at self-assembled monolayers: Optimization of surface functionalization," <i>J. Chem. Phys.</i> , 99(9):7012-7019 (1993)	<input type="checkbox"/>
	AJJ	Tarlov, M.J., et al., "UV Photopatterning of Alkanethiolate Monolayers Self-Assembled on Gold and Silver," <i>J. Am. Chem. Soc.</i> , 115:5305 (1993)	<input type="checkbox"/>
	AKK	Wagner, P., et al., "Covalent Immobilization of Native Biomolecules onto Au (111) via N-Hydroxysuccinimide Ester Functionalized Self-Assembled Monolayers for Scanning Probe Microscopy," <i>Biophysical Journal</i> , 70:2052-2066 (1996)	<input type="checkbox"/>
	ALL	Xia, Y., et al., "Use of Controlled Reactive Spreading of Liquid Alkanethiol on the Surface of Gold To Modify the Size of Features Produced by Microcontact Printing," <i>J. Am. Chem. Soc.</i> , 117:3274-3275 (1995)	<input type="checkbox"/>

Examiner Signature		Date Considered	
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Group Art Unit	1627
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Sheet 4 of 4

## **OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

Exami ner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	AMM	Yang, J.Y., <i>et al.</i> , "Binary self-assembled monolayers: spectroscopy and application to liquid crystal alignment," Masuhara <i>et al.</i> , Eds.; <i>Microchemistry</i> , North-Holland, Amsterdam, 1994, p.441	<input type="checkbox"/>
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